

In the Matter of the Petition to add New Brunswick, Canada's Saint John River Shortnose Sturgeon (*Acipenser brevirostrum*) as a Distinct Population Segment (DPS)

Petition to the United States Department of Commerce, National Oceanic Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS)

**Attention: Secretary Penny Pritzker
United States Department of Commerce
1401 Constitution Avenue, NW
Washington, D.C. 20230**

**Copy to: NMFS Assistant Administrator for Fisheries, Eileen Sobeck
NOAA Fisheries
1315 East-West Highway
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PETITION OF DR. MICHAEL J. DADSWELL, DR. MATTHEW K. LITVAK AND JONATHAN D. BARRY TO ADD THE SAINT JOHN RIVER SHORTRNOSE STURGEON POPULATION AS A DISTINCT POPULATION SEGMENT AND CONTEMPORANEOUSLY ALIGN THE STATUS DETERMINATION THAT THIS POPULATION HAS BEEN RATED BY THE COMMITTEE ON THE STATUS OF ENDANGERED WILDLIFE IN CANADA AND THE CANADIAN SPECIES AT RISK ACT

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SEPTEMBER 22, 2014

Introduction

Petitioners Dr. Michael J. Dadswell (“Dadswell”), Dr. Matthew K. Litvak (“Litvak”) and Jonathan D. Barry (“Barry”) hereby petition the United States Department of Commerce and the National Oceanic Atmospheric Administration (“NOAA”) and the National Marine Fisheries Service (“NMFS”) pursuant to Section 4(b)(3), 16 U.S.C. § 1533(b)(3), of the Endangered Species Act (“ESA”), *id.* §§ 1531-1544 and Part 424 of its Title 50: Fisheries and Wildlife Code of Federal Regulations (50 CFR Ch. IV 10-01-07 Edition) to add the *Acipenser brevirostrum* Sturgeon species (Shortnose Sturgeon) native to New Brunswick, Canada’s Saint John River as a Distinct Population Segment (“DPS”) and, contemporaneously utilize the scientific evidence and reviews inherent within the current status designations for the Saint John River Shortnose Sturgeon (“SJRSS”) as found in the Canadian Species at Risk Act (“SARA”) and the Committee on the Status of Endangered Wildlife in Canada (“COSEWIC”). SARA and COSEWIC have determined through multiple reviews since 1980 that the SJRSS population status is “Special Concern”, which Petitioners maintain is substantially equivalent to the NMFS rating of Species of Concern, but does not warrant a listing of threatened nor endangered under the ESA.

The Saint John River Shortnose Sturgeon has been recognized as a DPS by scientists and governmental bodies in Canada and the United States dating back to the comprehensive Saint John River Shortnose Sturgeon biology and population study of Dadswell (1979). This Petition will show that the Saint John River Shortnose Sturgeon DPS meets all criteria for DPS status as detailed in the USFWS and NMFS policy (Federal Register Doc. 96-2639) on recognizing a DPS for listing or delisting a species under the ESA. Further this Petition asks for contemporaneous status designation under the ESA that is consistent with the formally recognized status applied to the SJRSS DPS in Canada since 1980. This Petition demonstrates the SJRSS population does not warrant a listing under the ESA and that information available in subsequent investigations corroborate the status of this population as originally found by COSEWIC (1980). The subsequent investigations and scientific evidence demonstrate that the original listing and taxonomic designation of the SJRSS population was made in error. Further, this Petition requests that the SJRSS population be considered an independent unit from the probable rangewide status review and treated expeditiously as per the 1996 DPS Policy (Federal Register Doc. 96-2639) which states “*The Services’ ability to address local issues (without the need to list, recover, and consult rangewide) will result in a more effective program*”. In addition NMFS Instruction 02-110-06 from July 1996 entitled “Endangered Species Petition Management Guidance” instructs a full status review only when a Petition is considered “substantial”. Given this Petition requests DPS treatment and status review for a population segment outside jurisdictional boundaries of the United States, and represents only a portion of the total population, the Petitioners believe its effect is not substantial to native U.S. riverine populations and therefore could be considered on its own without being coupled to a rangewide review.

Proper Geographical Name for the Saint John River (also referred to as the St. John River)

The Saint John River has historically been referred to as both the St. John River and the Saint John River. This name place confusion has persisted due to the many historical references using both naming conventions. In 1998, there was a decision by the Geographical Names Board of

Canada to officially recognize the proper name as the Saint John River. This Petition uses the officially recognized name as found in the Geographical Names Board of Canada listing. (<http://www4.rncan.gc.ca/search-place-names/unique/DAEEJ>)

Petitioners

Dr. Michael J. Dadswell is a Biologist at Acadia University in Wolfville, NS Canada. Dr. Dadswell has been involved in the study of Canadian sturgeon populations since 1966. His 1973-1977 work on the Saint John River and the SJRSS population includes some of the most cited and referenced works in Shortnose sturgeon biology history. Dr. Dadswell characterized the biology, spawning, life history, population and estuarine environment for the SJRSS over his 4 year study and has authored or co-authored 30 papers on various species of sturgeon. He estimated a population of 18,000 adults and a total population of 100,000 in the Saint John River estuary (Dadswell, 1979) – the largest known population of Shortnose sturgeon in the world at that time. He has continued to study and work on Shortnose and Atlantic sturgeon and is a strong advocate for proper scientific and ESA designation of the SJRSS population as a Distinct Population Segment. Dr. Dadswell believes that the SJRSS population has been stable or improving since his original work in the 1970's and that the Saint John River estuary has attained its effective carrying capacity for the SJRSS population since shortnose are now known to be migrating into the upper portion of the Bay of Fundy to feed (Dadswell et al 2014).

Dr. Matthew K. Litvak is a Biologist at Mount Allison University in Sackville, NB Canada. Dr. Litvak has been the foremost researcher for the SJRSS population since 1998. His work has included the finding, characterization and population estimates for a newly found overwintering site in the Kennebecasis River tributary, the characterization of SJRSS recruitment, spawning grounds, eggs, larval, juvenile and adult sturgeons, monitoring of the SJRSS recreational fishery, tagging and spatial monitoring, and many studies related to the growth, food conversion capability, maturation, morphology, haematology and physiological characteristics of the SJRSS population. Dr. Litvak has estimated a stable population of 4,866 adults in the recently discovered overwintering site on the Kennebecasis River and supports the population estimates of Dr. Dadswell. In addition to authoring 13 papers, 2 proceedings, 1 book chapter and 2 COSEWIC reports on the SJRSS population of Shortnose sturgeon, conducting and supervising research and teaching at Mount Allison, Dr. Litvak is an active conservationist with strong belief in the DPS status and resulting localized conservation management of the SJRSS population.

Jonathan Barry is a New Brunswick conservationist and Managing Director of the first CITES (Convention on International Trade in Endangered Species) approved captive breeding facility for the SJRSS. His current organization, Breviro Caviar Inc., is an aquaculture operation actively breeding and growing Shortnose sturgeon that originated from SJRSS broodstock in 1997. He works with biologists and scientists that conducted original SJRSS research at the Huntsman Marine Science Centre in St. Andrew's, NB Canada, which subsequently resulted in their active culture on a larger scale in the early 2000's. Since his involvement in 2010, Breviro has partnered with scientists and conservationists to offer its stock and biological expertise to further the biological understanding of the SJRSS and other Shortnose populations. The company has conducted extensive research and has developed intimate understanding of the

biology and physiology of the SJRSS population. CITES allow *Breviro* to operate in virtually every country in the world except the United States. Presently restricted or severely hindered from working with and partnering with U.S. organizations and scientists due to the current ESA listing, Mr. Barry also seeks the proper scientific DPS recognition and status of the SJRSS population to further the strong links between conservation and aquaculture operations.

Authority and Proposed Process

Fisheries and Oceans Canada, the New Brunswick Department of Natural Resources and the New Brunswick Department of Agriculture, Aquaculture and Fisheries work cooperatively and have legislative authority to protect and regulate fisheries and aquaculture in their respective jurisdictions as well as to protect endangered species. The Canadian Species at Risk Act (SARA) provides the legislative authority to protect the Saint John River Shortnose Sturgeon, and it is currently afforded protection as a Schedule 1, Species of Special Concern. The competent ministry is Fisheries and Oceans Canada as per section 65 of SARA. This status designation is in agreement with the scientifically independent COSEWIC status rating, and amongst the protections, it legislates a continuing management plan for the Saint John River Shortnose Sturgeon DPS (Management Plan for the Saint John River Shortnose Sturgeon, Fisheries and Oceans Canada, 2014).

The USFWS, NMFS and NOAA protect Endangered Species through the United States Endangered Species Act, and in the case of *Acipenser brevirostrum*, work collaboratively toward listing, delisting, classifications and determination of DPS populations. With regard to the *Acipenser brevirostrum* species, overlap occurs when that species range exists in more than one country and their respective legislation or regulations and status ratings vary for the same species. This petition will show that a group of this species forms a Distinct Population Segment (DPS) in New Brunswick, Canada's Saint John River and the Petitioners wish to use the petition process referenced in the following paragraph to request DPS treatment of this group and have its status contemporaneously determined under the ESA using the best scientific evidence available and consistent with previous determinations by COSEWIC and SARA.

Supporting letters and reports from the Minister of Fisheries and Oceans Canada and the Province of New Brunswick will be sent in follow up to this Petition.

Taxonomy and Background Information on *Acipenser brevirostrum*

Kingdom: Animalia
Phylum: Chordata
Class: Osteichthyes
Order: Acipenseriformes
Family: Acipenseridae
Genus: *Acipenser*
Species: *brevirostrum*

The Shortnose Sturgeon, *Acipenser brevirostrum* LeSueur, 1818, is an anadromous species which occurs in at least 26 watersheds along eastern North America from the Saint John River, New Brunswick, Canada to the St. Johns River, Florida (Kynard 1997, NMFS 1998). Unlike the Atlantic sturgeon, Shortnose Sturgeon populations are more closely confined to their natal watersheds and move only short distances seaward (Dadswell 1979; Fernandes et al. 2010; Peterson and Farrae 2011) and are known to become landlocked in freshwater by dams (Root 2002; Collins et al. 2003).

The biology and population size of Shortnose Sturgeon stocks was poorly known before the 1970's but in response to its listing as 'endangered' by the USA Endangered Species Act in 1973 numerous studies have greatly expanded our knowledge of this species (Dadswell et al. 1984a; NMFS 1998). Recent and ongoing population studies for many of the riverine populations north of the Chesapeake Bay region demonstrate stable or increasing abundance.

The Saint John River Shortnose Sturgeon (*Acipenser brevirostrum*) occurs in only 1 river system in Canada - the Saint John River in New Brunswick, Canada. Shortnose Sturgeon have been recorded at lengths of over a meter and at ages in excess of 60 years. The Saint John River Shortnose Sturgeon is the most northerly population of the species. The Saint John River is considered a baseline against which other estuaries on the east coast of North America can be compared because it is the only estuarine system where population sizes of Shortnose Sturgeon are known to be relatively stable over the last 40 years (Dadswell 1979; Li et al 2007; Usvyatsov et al. 2012a)

2009 and 2013 mtDNA and nDNA evidence suggests that they may also be one of the most genetically distinct (<http://www.dfo-mpo.gc.ca/species-especes/species-especes/shortnosesturgeon-esturgeonamuseaucourt-eng.htm>). A population estimated at 18,000 adults and 100,000 total population was determined during 1973-1977 for the Saint John River (Dadswell, 1979). Recent work from 1998-2007 in the Kennebecasis River, a tributary of the Saint John River, the location of just one of at least five documented over wintering grounds, produced an estimate of 4,836 adults in just a 2 hectare area. (Li et al 2007; Usvyatsov et al. 2012). Importantly, this location was not included in Dadswell's 1979 study and population estimate. While, there is no updated estimate for the complete lower estuary of the Saint John River, all scientific evidence supports a stable or growing population of 18,000 adults or greater as estimated in the original 1973-77 work (Dadswell 1979; Li et al 2007; Usvyatsov et al. 2012a). Shortnose sturgeon are now known to occur in the inner Bay of Fundy (approximately 160 km from the Saint John; Dadswell et al. 2014) and it is thought these are fish that have left the Saint John River in summer in search of additional foraging opportunities.

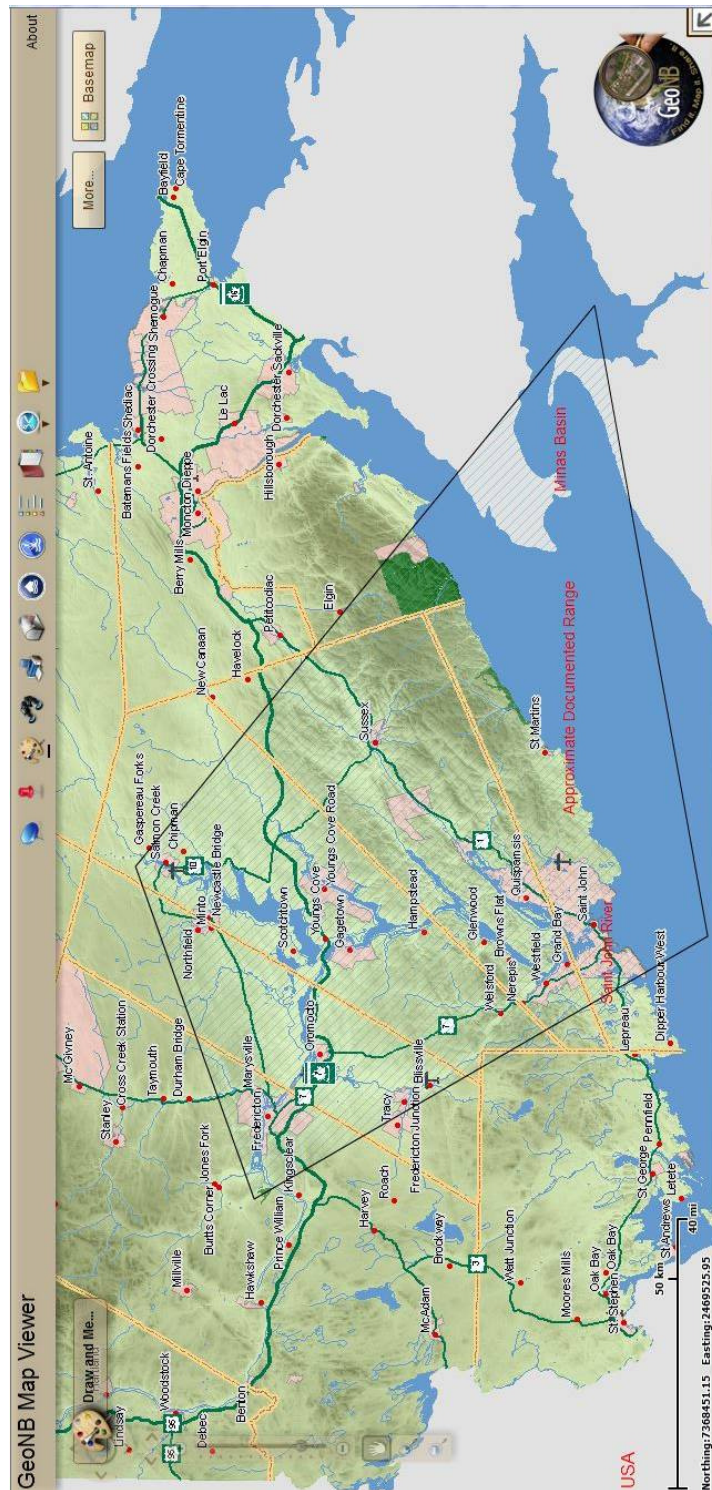
Saint John River Shortnose Sturgeon males reach maturity at roughly 11 years of age and spawn every second year. Females mature later at approximately 13 years of age and spawn every 2 to 4 years, with most spawning every 3 years (Dadswell 1979) and laying up to 200,000 eggs. Females bred in captivity with similar water temperature, photoperiod and water conditions to the Saint John River spawn approximately every 2 years. And while captive bred animals benefit from better feeding regimes – the captive breeding results for this most northerly population may suggest that natural spawning could occur more frequently than previously thought.

The Shortnose Sturgeon spawns in fast flowing water over a boulder and gravel bottom. They generally overwinter in the lower reaches of the Saint John River and in the spring migrate upstream as far as the Mactaquac Dam to spawn. The eggs sink, are adhesive and attach themselves to the rocks and gravel on the bottom of the river. After hatching, the larvae drift downstream.

Little is known about the juveniles, but the mean size of juveniles decreases upriver suggesting younger fish utilize more upstream habitats, and the area beneath the Mactaquac Dam has proven steady recruitment of larvae and juveniles (COSEWIC 2005; Usvyatsov et al. 2012b, 2013ab). Juvenile sturgeon usually migrate upstream in the summer and as the temperature in the river drops in the fall, move back downstream. It is thought that survival at the juvenile stage is critical to population abundance, and the studies of the Saint John River Shortnose Sturgeon since the 1970's continue to show steady and successful recruitment (Usvyatsov et al. 2012b, 2013a). The scientific evidence at hand for current and past population estimates, age-population structure, recruitment, spawning intervals and habitat improvements are all strong indicators of a thriving, stable Saint John River Shortnose Sturgeon population.

A 2011 report entitled *The Saint John River: A State of the Environment Report* by the Canadian Rivers Institute found the water quality of the Saint John River has improved since the 1960's, especially in the 2000's. They also found the habitat range of the SJRSS has the greatest diversity of freshwater fish in Maine and Atlantic Canada and that the population of the SJRSS is stable and secure. (Canadian Rivers Institute, 2011)

Figure 1 – Updated range for the SJRSS Population including recently found Shortnose in the Minas Basin, N.S. (and assuming that this Shortnose originated from the SJRSS population)



Designation of a Distinct Population Segment under the ESA following the Policy Directive of USFWS and NMFS

The Saint John River Shortnose Sturgeon has been recommended as a DPS since the NMFS status review in 1987. The NMFS recognized and recommended the Saint John River Shortnose Sturgeon as a DPS in its 1998 Final Recovery Plan for the Shortnose Sturgeon. The 2010 Shortnose Sturgeon Recovery Team completed a further biological summary in which it “recommends that each riverine population be considered as a separate management/recovery unit”. A group of U.S. scientists with considerable Shortnose sturgeon expertise (King et al 2014) used a nuclear DNA analysis to further the genetic analysis already completed using mitochondrial DNA; their work confirmed the genetic distinctiveness of the SJRSS population and the authors suggested that the SJRSS is a Distinct Population Segment. Fisheries and Oceans Canada commissioned a Canadian Science Advisory Secretariat review in 2014 to consider the DPS status and population abundance of the SJRSS population. That review concluded that the SJRSS should be strongly considered a DPS under the ESA and a Designatable Unit (DU) in Canada. It also concluded that the best science available affirms the population estimates of Dr. Dadswell and Dr. Litvak. (Canadian Science Advisory Secretariat, 2014)

Therefore this Petition simply builds upon, and further validates, the scientific and commercial evidence and recommendations presented in the Shortnose Sturgeon Status Reviews of 1987, 1998, the scientific papers referenced herein that characterize the biological, ecological and genetic distinctness of the different riverine populations of Shortnose sturgeon and the recommendations of the Shortnose Sturgeon Status Recovery Team in 2010.

It is understood that three elements are considered in a decision regarding the status of a possible DPS as endangered or threatened under the Act:

1. Discreteness of the population segment in relation to the remainder of the species to which it belongs;
2. The significance of the population segment to the species to which it belongs; and
3. The population segment’s conservation status in relation to the Act’s standards for listing (i.e., is the population segment, when treated as if it were a species, endangered or threatened?).

Petitioners understand that this Petition will likely trigger a rangewide status review for Shortnose sturgeon. The Petitioners support a rangewide review, but per earlier references, respectfully request that the designation of the SJRSS population be treated independently and published on its own merits and schedule. The rationale for this request is supported within this Petition.

Discreteness of the Saint John River Shortnose Sturgeon

A DPS may be considered if it meets one of two criteria for discreteness. The Saint John River Shortnose Sturgeon satisfies both criteria, and therefore clearly warrants consideration of being defined as discrete.

1) The Saint John River Shortnose Sturgeon are markedly separated by geography, range and physical constraints from other species in this taxon. Its nearest population neighbour, from the Kennebec, Androscoggin and Penobscot rivers in Maine (now typically referred to as the Gulf of Maine metapopulation) show no interbreeding with the SJRSS. Despite significant recent activity, no tagging nor population studies in either the Gulf of Maine nor the Saint John River have demonstrated species from either population migrates coastally to the other.

Further, and more compelling, is the study by Wirgin et al, 2009 which used mitochondrial DNA (mtDNA) control region analysis to study 14 of 19 river populations, including the Saint John River, and determined that the Saint John River Shortnose Sturgeon is a genetically discrete population. In terms of any relation to its nearest neighbour to the south, it states “*In contrast, the haplotype frequency in the Penobscot River sample was significantly different than that in the collection immediately to its north, the Saint John River*”.

This study has been broadly peer reviewed, including review by Dr. Paul Wilson, Canada Research Chair in DNA Profiling, Forensics and Functional Genomics. With 48 updated samples, Dr. Wilson has validated the mtDNA analysis of the Saint John River Shortnose Sturgeon through his laboratory and continues to further refine the control region analysis in attempts to delineate captive bred Saint John River Shortnose Sturgeon from those found in the wild. His laboratory and the work of Masters candidate Emily Kerr have documented additional mtDNA distinctiveness through finding a never before documented haplotype, only occurring in the Saint John River population. (Personal communication, Dr. Paul Wilson and Emily Kerr, Trent University Department of Biology)

Lastly, and already referenced above, King et al 2014 and the Canadian Science Advisory Secretariat have reviewed both mtDNA and nDNA and concluded that the SJRSS population is genetically distinct using both genetic analyses. Coupled with the biological, ecological, geographical and international boundaries that all support a DPS designation, the SJRSS population is emphatically discrete.

2) The Saint John River Shortnose Sturgeon is delimited by the international governmental boundary between Canada and the United States within which differences exist in control of exploitation, management of habitat, conservation status, and regulatory mechanisms that are significant in light of section 4(a)(1)(D) of the ESA. The most significant difference is that the “Endangered” status applied under the ESA, has never been applied nor warranted by Canadian authorities for the Saint John River Shortnose Sturgeon. In fact, the two foremost biologists who have studied the Saint John River Shortnose Sturgeon over the past five decades (Litvak and Dadswell) have never considered the population as Endangered nor Threatened (using the scale as applied by the ESA) and believe it has maintained a stable population since the formative work of Dadswell in the 1970’s.

Despite the regulatory differences and differences in determination of Saint John River Shortnose Sturgeon status between the ESA and Canada’s SARA/COSEWIC, Canada’s approach to conservation is very well regarded, contains substantial independent scientific review and input, and most importantly, has clearly supported good management and a healthy population for Saint John River Shortnose Sturgeon. In accordance with Federal Register Doc.

96-2639, the Services must give consideration to the legislation, conservation activities, science and status determinations of Canada.

Further Federal Register Doc. 96-2639 also states “*Nevertheless, it appears to be reasonable for national legislation, which has its principal effects on a national scale, to recognize units delimited by international boundaries when these coincide with differences in the management, status, or exploitation of a species.*”

The long-standing status determination differences are significant in light of the restrictions imposed as a result of the ESA. They support an expeditious DPS determination and status review for the SJRSS, while allowing the ESA’s national scale and legislation to focus on riverine populations within U.S. international boundaries. The status review change is supported by science and investigations now available that show the original listing was made in error or on the basis of the best science available supporting the population as being recovered.

Significance of the Saint John River Shortnose Sturgeon population

The biological and ecological significance of the Saint John River Shortnose Sturgeon needs to be considered in light of Congressional guidance (see Senate Report 151, 96th Congress, 1st Session). In carrying out this examination, the Services must consider available scientific evidence of the discrete population segment’s importance to the *Acipenser brevirostrum* taxon to which it belongs.

This consideration should include the following:

1. The persistence of the Saint John River Shortnose Sturgeon is clearly in an ecological setting that is unique for the taxon. It is the most northerly river system for the taxon, and demonstrates considerable biological, ecological and genetic uniqueness from any other possible DPS within the taxon, including its nearest neighbouring population in the Androscoggin, Kennebec and Penobscot rivers of Maine – populations also widely considered to be healthy. A strong and well documented analysis of the Gulf of Maine range is contained within the June 19, 2009 Federal Register 29344, Determination of the Endangered Status for the Gulf of Maine Distinct Population Segment of Atlantic Salmon. The Petitioners refer to this document and suggest it (along with its referred papers) provide a strong basis for utilizing the same northern terminus for the range and for comparison of unique differences from the Saint John River estuary (Dadswell, 1979 and Canadian Rivers Institute, 2011)
2. The loss of this DPS would result in a significant gap in the range of *Acipenser brevirostrum*, with the SJRSS population carrying many unique genetic, estuarine and geographic characteristics, clearly of significant importance to the taxon and its conservation.
3. The Canadian SJRSS is the only known surviving natural occurrence of this DPS taxon in its historic range.
4. As previously stated and referenced above, the Saint John River Shortnose Sturgeon differs markedly from other populations of the species in its genetic characteristics, exhibits natal river

homing for its documented spawning, and as such can be considered to be reproductively isolated. (Dadswell, 1979)

Status of the Saint John River Shortnose Sturgeon population under the ESA

If a population segment is discrete and significant (i.e., it is a distinct population segment) its evaluation for endangered or threatened status will be based on the ESA's definitions of those terms and a review of the factors enumerated in section 4(a) of the ESA. Further, USFWS and NMFS must consider the legislated protection, management and jurisdictional ratings of Canada's SARA and COSEWIC, and use those ratings together with all scientific and commercial evidence available to make its status determination. Given the ratings of COSEWIC and SARA are scientifically reviewed, independently developed and follow similar criteria for status designations inherent within the ESA, the Petitioners respectfully request expeditious and independent (independent of a rangewide review) consideration.

The five factors for status consideration under the ESA include:

- (A) the present or threatened destruction, modification, or curtailment of its habitat or range;
- (B) overutilization for commercial, recreational, scientific, or educational purposes;
- (C) disease or predation;
- (D) the inadequacy of existing regulatory mechanisms; or
- (E) other natural or manmade factors affecting its continued existence.

An abundance of scientific papers, population studies, genetic work, and reviews of *Acipenser brevirostrum* have taken place since the original listing of this species. Many of these studies and papers are included as references to this Petition, and when considered together, form a very strong scientific basis for the status of the Saint John River Shortnose Sturgeon as a DPS and its status to be considered a Species of Concern under the ESA. While Petitioners believe the SJRSS should be a Species of Concern (a recognized designation by NMFS and substantially similar to the SARA and COSEWIC status of Species of Special Concern) given it is the most northerly population of the taxon and a DPS, it has never required nor been designated as Threatened nor Endangered. In fact, the primary rationale for the SJRSS rating as a Species of Special Concern is due to it being the only occurrence of the species in Canada, and that it represents the most northerly range known for its taxon. (Canadian Rivers Institute, 2011) *Most importantly, no paper, scientist nor scientific study could be found which would suggest that the population of the Saint John River Shortnose Sturgeon has declined or worsened let alone warrant a classification of Endangered or Threatened. Further, the Petitioners could find neither scientific papers nor scientists for any riverine system north of the Chesapeake Bay that suggests a decline or worsening of the Shortnose population over the past three decades. Our conclusion is that, despite some continuing threats, the regulations and riverine ecology in both the U.S. and Canada have contributed to stable or growing abundance for Shortnose in virtually all of their mid-Atlantic and northern populations.*

(A) Threats

The Saint John River Shortnose Sturgeon face threats as outlined in the current COSEWIC and SARA status updates found on their websites and as updated in the soon to be released 2014

Fisheries and Oceans Canada Management Plan for the SJRSS (Fisheries and Oceans Canada. 2014). All three Petitioners participated in reviews and consideration of the threats to the SJRSS and also provided review to the upcoming Fisheries and Oceans Management Plan. Collectively the Petitioners and reviewers concluded that the threats identified could affect the population but importantly, none had supporting evidence to suggest an adverse affect on the population over the past 40 years.

COSEWIC: http://www.cosewic.gc.ca/eng/sct1/searchdetail_e.cfm?id=113 and

SARA: <http://www.dfo-mpo.gc.ca/species-especes/species-especes/sturgeon-esturgeonamuseaucourt-eng.htm>)

COSEWIC's website publication summarizes the SJRSS threats and status by stating *"There is some risk to the species through mortality from hydroelectric facilities, by-catch in alewife and shad fisheries, and poaching. However, there is no immediate threat that would lead to elimination of the population in a very short period of time."*

The current threats do not include any known destruction, modification or curtailment of its habitat, and in fact, these threats are mitigated by significant conservation management and legislative protection through Fisheries and Oceans Canada, the New Brunswick Clean Water Act and the New Brunswick Fish and Wildlife Act. Perhaps the single largest threat is the Mactaquac Dam, which could affect spawning grounds through water flow or through needed upgrades (or decommissioning), affect the spawning grounds. However, this threat is closely managed with the Canadian Rivers Institute currently conducting a study of the Mactaquac Aquatic Ecosystem with specific studies of the SJRSS population included. Furthermore, the Mactaquac Dam represented a major habitat change for the SJRSS during its construction, yet like other riverine systems with Shortnose populations, now represents a fertile spawning ground with steady recruitment of the SJRSS since its completion in 1967.

The Canadian Rivers Institute has completed more than 100 studies of the Saint John River since 2001, including studies of the health and abundance of fish communities in the lower reaches of the Saint John. (Canadian Rivers Institute, 2011) Its conclusions of improved water quality and stable and secure population of the SJRSS provide further validation of the long-standing status of the SJRSS as Special Concern.

Allen Curry, the Director of the Canadian Rivers Institute stated in an interview with the Telegraph Journal on July 17, 2013 that the Saint John River below the Mactaquac Dam *"...is the greatest diversity of fish species in eastern North America. Everything is really good there..."* The temperature increases in the river and cleaner water from improved wastewater treatment as well as commercial fisheries closures (striped bass) were duly noted and provide an improved environment for the Saint John River Shortnose Sturgeon, with all conditions being beneficial to their growth and maturation rates. In addition, the Fraser Report entitled Canadian Environmental Indicators – Water stated *"Overall, the evidence suggests that water quality in New Brunswick is overwhelmingly good and has improved over time, leading to a healthier aquatic ecosystem"*.

(B) Overutilization

There is legislated protection from overutilization for commercial, recreational, scientific and educational purposes. With an active and successful recreational fishery existing in New Brunswick since 1973, the population has still maintained or improved its estimate of 18,000 adults originally made by Dr. Dadswell (Dadswell 1979; Li et al 2007; Usvyatsov et al. 2012a; Stokesbury et al. 2014). It has possibly even attained its full population carrying capacity, as is evidenced by recent coastal migrations of (presumed) Saint John River Shortnose Sturgeon to the Minas Basin of Nova Scotia. (Dadswell et al, 2014). Recreational fishers and an annual fishing derby on the Kennebecasis River held every October for the past 26 years have greatly contributed to verification of the stable adult SJRSS population in the Kennebecasis River tributary.

(C) & (E) Disease/predation/other factors

There have been no noted disease nor predation threats for the wild population of the Saint John River population since 1973. As referenced above, the regulatory mechanisms in Canada through Fisheries and Oceans Canada and the province of New Brunswick have clearly well supported, managed and maintained the Saint John River Shortnose Sturgeon. And finally, aside from an unlikely catastrophic event at the Mactaquac Dam, there are limited natural or manmade factors which would affect its continued existence.

(D) Regulations

None of the scientific studies have noted a population decline nor worsening of the population of the Saint John River Shortnose Sturgeon since 1973. As part of the SARA legislation, a Federally mandated Fisheries and Oceans Canada Management Plan for the Saint John River Shortnose Sturgeon is currently being finalized. This plan will further improve a regulatory system which has already allowed the Saint John River Shortnose Sturgeon population to flourish. Consultations took place in 2013 and 2014 with scientists, regulators, federal and provincial governments, First Nations and the recreational and commercial stakeholders with comprehensive consideration of threats, population status and the ongoing stewardship of this DPS. All scientific reviews and public consultations have resulted in additional support and recommendations for proactive conservation measures, but have also verified the SJRSS population status and abundance, and the current regulations protecting the SJRSS.

Current Population of the Saint John River Shortnose Sturgeon

The Services' DPS policy of 1996 states *“It may be appropriate to assign different classifications to different DPS's of the same vertebrate taxon.”* In fact, this is what has been in place with the SJRSS population, whereby its status has been assigned a different classification in Canada since first being listed under the ESA in 1967. The Petitioners wish to rectify this original classification error, especially in light of the subsequent investigations and status reviews that have demonstrated the SJRSS population to be stable or improving.

The population estimates of the Saint John River Shortnose Sturgeon have been previously discussed (in excess of 18,000 adults and over 100,000 total population) and agreed during the

most recent Canadian Science Advisory Secretariat review (Canadian Science Advisory Secretariat, 2014). The following section therefore elaborates on updated works done to establish clear and objective determinations for sturgeon population health and relative distance to becoming threatened. A 2011 paper called the “The SAFE index: using a threshold population target to measure relative species threat” uses a minimum viable population of 5,000 adults for mammal species and bases this on several prior studies (Reed et al., 2003; Traill et al., 2007; Thomas, 1990; Frankham, 1995). The SAFE paper proposes a heuristic and numerically explicit metric to predict a species ability to forestall extinction (Clements et al, 2011). A 2011 paper that studied the minimum viable population for Lake Sturgeon (*Acipenser fulvescens*) concluded that as few as 80 adults could constitute a Minimum Viable Population (MVP) (Schueller and Hayes, 2011). The Schueller and Hayes paper included genetic factors as a significant component of MVP for Lake Sturgeon and in particular considered the possible effects of inbreeding depression. *“The estimated MVP without inbreeding effects was 80 individuals. For some scenarios incorporating inbreeding, MVP did not change, but for others, MVP was substantially higher, reaching values up to 1800.”* (Schueller and Hayes, 2011)

The Connecticut River population of Shortnose sturgeon apparently validate the resilience of small populations. The Holyoke Dam separated the Connecticut River population into an upstream and downstream population in 1848. Despite over 116 years of complete separation until the construction of the dam’s Fishway in 1965, the upstream population persisted with a currently estimated population of 450 spawning adults. Further, it is now believed that the upstream population is the only spawning source for both the downstream and upstream populations of Shortnose in the river.

(<http://www.bio.umass.edu/biology/conn.river/sturgeon.html>) The fish pathway (measuring and counting fish passage since 1965) has counted just 57 shortnose sturgeon migrations through the Fishway from 1996 to 2014. (HG&E, Annual Anadromous Fish Count Robert E. Barrett Fishway. <http://www.hged.com/community-environment/fishway/fish-counts.aspx>) With both mtDNA (Wirgin et al, 2009) and nDNA (King et al, 2014) finding the Connecticut River to be genetically distinct from other populations, the long-term survival and persistence of this population is a testament to very small populations of Shortnose being able to survive and forestall threats to extinction.

Aquaculture of sturgeon species, and specifically the SJRSS population, has proven that small numbers of sturgeon broodstock can produce large numbers of stock, with great variation in morphology, physiology, growth and maturation rates. The polyploidy nature of the SJRSS has been postulated to provide possibly great advantages for survival in the wild at very low numbers of MVP.

Stokesbury et al 2014 suggests consideration of the MVP for Shortnose sturgeon as 5,000 adults. This population level is considered a conservative approach for sturgeon given the biology of the Shortnose, other MVP studies and particularly the Schueller and Hayes, 2011 findings for Lake Sturgeon. Stokesbury et al 2014 also suggest that the carrying capacity of riverine estuaries can be considerably different (example, the SJRSS carrying capacity is 0.51 adults/Ha., similar to the Delaware at 0.64, but significantly different from the Hudson at 1.28), and therefore status determinations under the ESA or SARA/COSEWIC require an empirical approach such as SAFE for valid comparison across riverine systems.

Using the SAFE index to analyze the SJRSS population affirms the current and historical status ratings of COSEWIC and SARA, and supports the conclusion that the SJRSS does not warrant a Threatened listing under the ESA. (Stokesbury et al. 2014)

The MVP targets discussed in these papers, combined with over 40 years of stable population, suggest that the Saint John River Shortnose Sturgeon population has been properly categorized by COSEWIC and SARA since 1980. As stated in earlier conclusions in this Petition, the SJRSS should either be considered Recovered or removed from the ESA due to subsequent investigations demonstrating that the initial listing was made in error.

Request for Expeditious and Contemporaneous Determination of DPS Designation and Independent Status Review

An abundance of scientific data and evidence is available to the NMFS from papers, reports, population studies (past and current/ongoing) that support the designation of the SJRSS as a DPS. In addition to the papers referenced in this Petition, NMFS will also have updated reports from ongoing studies in many of the U.S. riverine systems. During the Petitioners review of available science and reports on Shortnose population north of Chesapeake Bay, none were found to demonstrate declining nor worsening population abundance. Further, the studies also demonstrate clear genetic, ecological and biological support for the designation of DPS units, with all scientific papers that have considered DPS designation of Shortnose sturgeon finding that the SJRSS population should be considered a DPS.

As intended in the Services' 1996 policy on DPS determinations "*The Services' ability to address local issues (without the need to list, recover, and consult rangewide) will result in a more effective program.*" (Federal Register Doc. 96-2639), the Petitioners hereby request that the SJRSS population be treated independently from a complete rangewide status review. The basis for this request is supported by:

- The Services' policy on DPS determinations as referenced above, whereby local issues can be dealt with more effectively without the need to consult rangewide;
- The Services' policy on DPS which refers to the need to consider Canadian jurisdiction, policies, protections and status determinations, especially where an international jurisdictional boundary coincides with a DPS and a different status determination from the ESA;
- The abundance of SJRSS scientific information and data available to NMFS;
- Subsequent investigations and scientific evidence now available has demonstrated that the original listing was made in error and therefore in light of the significant restrictions inherent within the ESA, expeditious rectification of this error should be made;
- The SJRSS population has always been treated as an independent management unit in Canada, and since 1980, its status rating has never risen to the level of Threatened;
- The basis for this Petition has been fully supported by independent scientific reviews and the authority of the Canadian government and specifically Fisheries and Oceans Canada, as well as the Province of New Brunswick through its Department of Aquaculture, Agriculture and Fisheries; and

- The current ESA listing unfairly restricts commercial and scientific interactions or trade between Canadian and U.S. institutions and organizations.

Aquaculture of the Saint John River Shortnose Sturgeon and its Contribution to Conservation

Aquaculture of the Saint John River Shortnose Sturgeon began at the well regarded Huntsman Marine Science Centre in 1997 and has fostered many contributions to the scientific understanding of the species biology. Two commercial entities exist in New Brunswick, both performing sustainable land-based aquaculture of the Saint John River Shortnose Sturgeon. Breviro is highly active in the scientific study, collaboration and conservation of the Saint John River Shortnose Sturgeon with many past and ongoing partnerships with both students and scientists studying the Saint John River Shortnose Sturgeon DPS.

Breviro and its predecessor company (Supreme Sturgeon and Caviar), have maintained a valid CITES Appendix I Captive Breeding License since 2008. The farm locations of Breviro are both land-based and have no connectivity to the Saint John River, so there is no chance of accidental release.

The science and genetic testing available today helps protect the full North American range of *Acipenser brevirostrum* species from any poaching or illegal commercial exploitation and allows for proven “farm-to-fork” control of Saint John River Shortnose Sturgeon captive breeding commercial operations. In addition to freely contributing biological samples and information with scientists, Breviro is actively working with Dr. Litvak to assist in the development of a stable isotope test that will positively identify captive bred Saint John River Shortnose Sturgeon from wild caught Saint John River Shortnose Sturgeon. Results to date provide for positive identification of both sturgeon and processed caviar. Together with mtDNA or nDNA, this new test will be another tool that can be used by any regulatory authorities to ensure ongoing protection of the species in the wild and will explicitly confirm the origins of Saint John River Shortnose Sturgeon and any by products.

The mtDNA genetic testing already available to prove Saint John River Shortnose Sturgeon distinct from any of the other riverine Shortnose Sturgeon populations, is being further refined by Dr. Paul Wilson of Trent University in an attempt to further delineate the control region analysis and differentiate captive bred Saint John River Shortnose Sturgeon from those in their native habitat.

In addition to this, aquaculture operations have contributed greatly to the biological understanding of the Saint John River Shortnose Sturgeon in the following areas:

- Spawning intervals for mature females are noted to be 2 years or less, both in flow through systems and recirculation systems using seasonal temperatures similar to the Saint John River.

- Thermal profiles for maximum and minimum temperature ranges, durations, growth rates, food conversion and survival rates;
- Feeding, growth and food conversion rates
- Seasonal spawning and thermal indicators for spawning
- Larval and juvenile rearing, survival rates, thermal shocks, feeding, thermal optimums for spawning, water quality and water flow
- Heavy metal contaminant impacts such as iron, copper, lead, mercury and zinc
- Construction noise impacts to behaviour
- Vitellogenesis cycles and thermal and photoperiod cues
- Sex determination using non-invasive techniques such as ultrasound
- Maturation rates for females and males under seasonal temperatures, controlled and elevated temperatures, flow through systems and recirculation systems

The active aquaculture of Saint John River Shortnose Sturgeon has been and continues to be a very positive contributor to the conservation and scientific understanding of *Acipenser brevirostrum* and specifically the SJRSS. Other countries around the world and the World Sturgeon Conservation Society (WSCS) also actively promote aquaculture of sturgeon for its positive attributes towards conservation, and the most recent WSCS International Sturgeon Symposium in Nanaimo, British Columbia, of which two of the three Petitioners participated, featured an aquaculture stream with hundreds of papers that contributed to both captive breeding and conservation understanding.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. CITES was drafted as a result of a resolution adopted in 1963 at a meeting of members of IUCN (The World Conservation Union). The Text of the Convention was finally agreed at a meeting of representatives of 80 countries in Washington, D.C., the United States of America, on 3 March 1973, and on 1 July 1975 CITES entered in force. (CITES Website <http://cites.org>, November 2013)

CITES currently lists *Acipenser brevirostrum* as Appendix I. This designation has historically been aligned with (and largely based on) the ESA's listing of Endangered and the IUCN's listing of Vulnerable for the species. CITES provides for a Captive Breeding license for Appendix I species, which it uses to allow for the non-detrimental trade in Appendix I species. The aquaculture operation of Breviro have operated under the CITES Captive Breeding license terms since its predecessor company met the stringent CITES standards in 2008. The Captive Breeding license permits all international trade using a CITES Export Permit and matching CITES Import Permit process.

Designating the Saint John River Shortnose Sturgeon as a DPS, and aligning the COSEWIC and SARA ratings for this DPS, will not change the CITES Appendix I status of *Acipenser brevirostrum* until a new resolution can be made following the CITES treaty process.

Therefore, the entire *Acipenser brevirostrum* species and the Saint John River Shortnose Sturgeon DPS will continue to fully benefit from CITES protections and trade management until such as time as the Treaty is updated. Any future resolution from the Petitioners that is proposed to CITES would only include the Saint John River Shortnose Sturgeon, and would be based on its DPS designation and status.

Summary Justification and Rationale for this Petition

1. Past, current and future scientific studies of the Saint John River Shortnose Sturgeon contribute greatly to the body of scientific knowledge for *Acipenser brevirostrum* and play a key role in the ongoing conservation of the species. Proper designation is fundamental to ongoing research, study and conservation of both the Saint John River DPS and other Shortnose Sturgeon DPS in the United States.
2. The Saint John River, New Brunswick *Acipenser brevirostrum* DPS is already recognized as distinct and the preponderance of all scientific and commercially available information reinforce this designation. The 2014 Canadian Science Advisory Secretariat review further affirmed this designation.
3. The Saint John River, New Brunswick *Acipenser brevirostrum* DPS is in the country of Canada, whose conservation programs, independent scientific reviews, foremost scientists, laws and regulations do not list it nor consider it as endangered nor threatened. Thus an error in the original classification of the SJRSS population has existed, which subsequent investigations have confirmed. The government of Canada, through Fisheries and Oceans Canada, and the Province of New Brunswick, through the Departments of Natural Resources and Agriculture, Aquaculture and Fisheries have participated in the latest reviews and fully support this Petition.
4. Canadian and American scientists have studied the Saint John River Shortnose Sturgeon DPS, and endorse proper population and status designation as being fundamental to ongoing scientific studies, conservation measures and understanding.
5. Saint John River Shortnose Sturgeon population levels in New Brunswick are strong, sustainable and corroborated by over five decades of significant scientific research. This river system and DPS is one of the most studied and well understood in the species range.
6. While threats to the Saint John River Shortnose Sturgeon will always exist, since its initial review by COSEWIC in 1980 none of the authorities nor scientists in any Canadian review has considered them to be significant enough to warrant a threatened classification. In fact, the Saint John River and the habitat of the Saint John River Shortnose Sturgeon enjoy better water quality, lesser wastewater and better conservation protection now than at any other point over the past 40 years.

Benefits

The recognition of current scientific knowledge, population and species accuracy to the Endangered Species Act regarding the *Acipenser brevirostrum* species is paramount to Congressional guidance and intent. Recognizing the Saint John River Shortnose Sturgeon as a DPS is entirely consistent with the scientific body of evidence, demonstrates an important riverine population that subsequent investigations demonstrate was listed in error and reinforces the DPS findings and recommendations in the 1987 and 1998 Shortnose Sturgeon Status

Reviews and the 2010 NMFS Shortnose Sturgeon Biological Assessment. It will foster continuing scientific studies and partnerships, as is evident already in New Brunswick with a combined body of educational, governmental and aquaculture operations all working together to successfully conserve, protect and cultivate the Saint John River Shortnose Sturgeon.

Inclusions to be sent under separate cover to NMFS

- Letter of support from Canadian Government Authority: Fisheries and Oceans Canada
- Letter of support from the New Brunswick Provincial Authority: Department of Natural Resources and/or the Department of Agriculture, Aquaculture and Fisheries
- Proposed Management Plan for the Saint John River Shortnose Sturgeon (*Acipenser brevirostrum*), Fisheries and Oceans Canada
- Science Response to Status Review of the Saint John River Shortnose Sturgeon (*Acipenser brevirostrum*) population, Canadian Science Advisory Secretariat

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Referenced and/or Consulted Professionals and Organizations

Fisheries and Oceans Canada

Environment Canada

Species at Risk Act Canada

Committee on Status of Endangered Wildlife in Canada

The Canadian Rivers Institute

New Brunswick Department of Agriculture, Aquaculture and Fisheries

New Brunswick Department of Natural Resources

The Great Sturgeon Hunt, Annual Fishing Derby, Quispamsis, NB, Pickwauket Lions Club

Dr. Matthew Litvak, Mount Allison University, Sackville, NB

Dr. Michael Dadswell, Acadia University, Wolfville, NS

Dr. James Kieffer, University of New Brunswick, Saint John, NB

Dr. Paul Wilson, Trent University, Peterborough, ON

USFWS, Branch of Foreign Species

NOAA, National Marine Fisheries Service

Breviro Caviar Inc., William Hogans, Michel Belanger, Jonathan Barry

Appendix A – The Canadian Species at Risk Act (SARA) and the Committee on the Status of Wildlife in Canada (COSEWIC)

The *Species at Risk Act* (SARA) is a key tool in the ongoing work to protect species at risk. By providing for the protection and recovery of species at risk, SARA is one of the most important tools in the conservation of Canada's biological diversity. It also complements other laws and programs of Canada's federal, provincial and territorial governments, and supports the efforts of conservation organizations and other partners working to protect Canadian wildlife and habitat.

SARA established the Committee on the Status of Wildlife in Canada (COSEWIC) as an independent, scientific advisory body with a mandate to assess the status of species at risk in Canada. On a yearly basis, COSEWIC assesses the status of Canadian species that may be at risk. The degree of risk to a species is categorized and assessed according to the following terms and definitions by COSEWIC:

- Extirpated — When a species no longer exists in the wild in Canada, but still exists elsewhere in the wild
- Endangered — The Species is facing imminent extirpation or extinction
- Threatened — The species is likely to become endangered if nothing is done to reverse threats
- Special Concern — Species at risk of becoming threatened or endangered

COSEWIC provides its assessment and supporting evidence for its classification of the species to the Minister of the Environment on a yearly basis. Within 90 days of receiving COSEWIC's assessments, the Minister of the Environment includes in the Public Registry a report indicating how he/she intends to respond to each assessment, including the scope of any consultations, and, to the extent possible, timelines for action. The Minister of the Environment then considers the assessment and makes a recommendation to the Governor in Council (GIC) on whether or not the species should be added to Schedule 1 of SARA. The GIC formally acknowledges receipt of the assessment and, within nine months, may, on the recommendation of the Minister,

(a) accept the assessment and add the species to the List;

(b) decide not to add the species to the List; or

(c) refer the matter back to COSEWIC for further information or consideration.

Species added to the List of Wildlife Species at Risk, Schedule 1 of SARA, benefit from the various protection measures and the mandatory recovery or management planning required under the Act. The Saint John River Shortnose Sturgeon benefit from a management plan currently being completed by Fisheries and Oceans Canada, and with consultations that took place throughout 2013 and 2014. Both the Canadian Science Advisory Secretariat review and the management plan have included extensive consultations with the same leading Canadian scientists and experts on the Saint John River Shortnose Sturgeon that have been consulted for this Petition.